

Message Text

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43

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FM AMEMBASSY GUATEMALA

TO SECSTATE WASHDC IMMEDIATE 185

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DEPT PLEASE PASS ROUTINE TO AMEMBASSY'S SAN JOSE, MANAGUA,
SAN SALVADOR, TEGUCIGALPA, MEXICO, USUN NY, USMISSION GENEVA,
SECDEF NIACT IMMEDIATE, JCS NIACT IMMEDIATE, USCINCSO NIACT
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AIDAC FOR AID/PHA/FDRC

E.O. 11652: N/A

TAGS: SWEL, GT

SUBJECT: GUATEMALAN EARTHQUAKE - US GEOLOGICAL SURVEY REPORT

1. EMBASSY HAS RECEIVED FOLLOWING MEMORANDUM FROM DR. GEORGE
PLAFKER, US GEOLOGICAL SURVEY.

2. A MAJOR FAULT THAT MAY HAVE BEEN THE CAUSE OF THE
DESTRUCTIVE EARTHQUAKE IN GUATEMALA ON FEB 4 HAS BEEN
IDENTIFIED IN THE MOTAGUA VALLEY AREA. NEW GROUND RUPTURES
WERE TRACED BY GEOLOGISTS DR. GEORGE PLAFKER OF THE U.S.
GEOLOGICAL SURVEY, DR. SAMUEL BONIS OF THE INSTITUTO
GEOGRAFICO NACIONAL AND MR. DAVID SCHWARTZ OF THE STATE
UNIVERSITY OF NEW YORK, DURING A RECONNAISSANCE FLIGHT IN A
LIGHT AIRCRAFT ON SATURDAY MORNING, FEB 7.

3. THE GROUND BREAKAGE WAS OBSERVED IN A CONTINUOUS,
WELL-DEFINED LINE FOR A DISTANCE OF 175 KMS. EXTENDING
FROM NEAR MOTAGUA

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ON THE EAST TOVAVCAREA BUT 20 MILES

NORTH OF THE CAPITAL ON THE WEST.

4. THE TOTAL LENGTH OF THE FAULT THAT BROKE DURING THE EARTHQUAKE IS PROBABLY SOMEWHAT MORE THAN 175 KMS., BUT ITS TRACE COULD NOT BE FOLLOWED IN THE AREA WEST OF QUIRIGUA WHERE IT IS OBSCURED BY SWAMPS. ON THE WEST END IT WAS DIFFICULT TO FOLLOW FROM THE AIR BECAUSE OF RUGGED TERRAIN AND NUMEROUS EARTHQUAKE-TRIGGERED LAND-SLIDES.

5. THE GEOLOGISTS EXAMINED THE FAULT ON THE GROUND AT A NUMBER OF LOCALITIES BETWEEN QUIRIGUA AND EL PROGRESO USING A JET RANGER HELICOPTER. THEY FOUND THAT THE FAULT TRACE CONSISTS OF A NARROW ZONE, GENERALLY FROM 2 TO 5 METERS WIDE, OF ECHELON FISSURES AND LOW RIDGES THAT INTERSECT THE SURFACE. INDIVIDUAL CRACKS ARE AS MUCH AS 10 METERS LONG AND 10 CMS. WIDE. DISPLACEMENT ACROSS THE FAULT IS ALMOST ENTIRELY HORIZONTAL, WITH THE NORTH SIDE SHIFTED WESTWARD RELATIVE TO THE SOUTH SIDE. MAXIMUM DISPLACEMENT ACROSS THE FAULT WAS 110 CMS. NEAR EL PROGRESO, WHICH IS THE MOST WESTERLY PART OF THE FAULT THAT WAS EXAMINED ON THE GROUND.

6. THE FAULT CAUSED EXTENSIVE DAMAGE TO BUILDINGS, ROADS, AND THE RAILROAD. IN ADDITION, THE CONCENTRATION OF DAMAGE IN THE VICINITY OF THE FAULT, PARTICULARLY IN COMMUNITIES SUCH AS GUALAN, CABANAS AND EL PROGRESO, IS PROBABLY DUE TO THE INTENSE SHAKING CLOSE TO THE SOURCE OF THE EARTHQUAKE.

7. THE EPICENTER, OR THE POINT AT WHICH FAULT RUPTURE STARTS, HAS BEEN LOCATED NEAR GUALAN CLOSE TO THE EAST END OF THE FAULT BY THE NATIONAL EARTHQUAKE INFORMATION CENTER IN BOULDER, COLORADO. THE FAULT BREAK THEN EXTENDS AT LEAST 175 KMS. WESTWARD TOWARDS GUATEMALA CITY. THE EXTENSIVE DAMAGE SUSTAINED BY THE CAPITAL AND MANY COMMUNITIES IN THE PROVINCES OF CHIMALTENANGO, TOTONICAPAN AND SACATEPEQUEZ RESULTS IN LARGE PART FROM THE PROMIMITY OF THESE AREAS TO THE FAULT AND ITS POSSIBLE EXTENSION TOWARDS THE WEST. HOWEVER, OTHER UNCLASSIFIED

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FACTORS, SUCH AS THE NATURE OF THE GEOLOGIC FOUNDATION CONDITIONS, TOPOGRAPHY, AND POSSIBLE MOVEMENTS ON SUBSIDIARY FAULTS, UNDOUBTEDLY INFLUENCE THE DISTRIBUTION OF DAMAGE RESULTING FROM SEISMIC SHAKING.

8. THE GEOLOGISTS NOTED THAT THE FAULT BREAKAGE CORRESPONDS CLOSELY IN THE MOTAGUA VALLEY WITH A WELL-KNOWN OLDER GEOLOGIC FAULT, BUT THE LOCATION OF THE FAULT WAS NOT KNOWN

PREVIOUSLY WEST OF EL PROGRESO.

9. THE FAULT IN THE MOTAGUA VALLEY IS OF GREAT INTEREST AND IMPORTANCE BECAUSE IT IS BELIEVED THAT IT EXTENDS FROM THE MIDDLE AMERICAN TRENCH ACROSS MEXICO AND GUATEMALA, AND THEN ALONG THE CAYMAN TROUGH IN THE CARIBBEAN SEA AS FAR EAST AS THE PUERTO RICO TRENCH. THIS FAULT ZONE, COMPRISES THE BOUNDARY BETWEEN A PART OF THE EARTH'S CRUST NAMED THE CARIBBEAN PLATE THAT INCLUDES THE CARIBBEAN AREA, SOUTHERN MEXICO, THE NORTHERN PART OF VENEZUELA AND THE NORTH AMERICA PLATE.

10. CUMULATIVE DISPLACEMENT ON THIS GREAT FAULT HAS OCCURED OVER TENS OF MILLIONS OF YEARS AND TOTALS ABOUT 180 KILOMETERS.

11. THUS, THE EARTHQUAKE OF FEB 4 IS THE MOST RECENT MOVEMENT IN A LONG HISTORY OF DISPLACEMENT ON THE MOTAGUA FAULT ZONE.

12. IT IS NOT KNOWN HOW FREQUENTLY EARTHQUAKES HAVE RECCURED AS A RESULT OF MOVEMENT ON THE MOTAGUA FAULT ZONE. HOWEVER, MANY OF THE TOPOGRAPHIC FEATURES NOTED BY THE GEOLOGISTS SUGGEST THAT THE FAULT IS GEOLOGICALLY YOUNG AND THAT IT MAY EVEN HAVE MOVED PREVIOUSLY DURING COLONIAL TIMES.

13. DR. PLAFKER NOTED THAT THE PREDOMINANTLY HORIZONTAL DISPLACEMENT THAT OCCURRED ON THE MOTAGUA FAULT IS SIMILAR TO FAULTING THAT HAS OCCURRED DURING GREAT EARTHQUAKES ON THE SAN ADRES FAULT SYSTEM IN CALIFORNIA, THE ANATOLIAN FAULT IN TURKEY, THE FAIRWEATHER FAULT IN ALASKA AND THE FAULTS THAT MOVED IN MANAGUA, NICARAGUA, DURING UNCLASSIFIED

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THE 1972 EARTHQUAKE.

14. UNLIKE OTHER TYPES OF EARTHQUAKES INVOLVING VERTICAL OR COMBINATIONS OF VERTICAL AND HORIZONTAL DISPLACEMENT, ALL OF THESE EVENTS WERE FOLLOWED BY AFTERSHOCK SEQUENCES IN WHICH THE SIZE OF SHOCKS DIMINISHES GRADUALLY WITH TIME. IF THE EARTHQUAKE OF FEBRUARY 4 FOLLOWS THIS SAME PATTERN, THERE SHOULD NOT BE ANOTHER DESTRUCTIVE SHOCK IN THE NEAR FUTURE.

15. ADDITIONAL GEOLOGICAL AND GEOPHYSICAL STUDIES ARE IN PREGRESS BY GEOLOGICAL PERSONNEL OF THE INSTITUTO NACIONAL AND OBSERVATORIO METEREOLOGICO NACIONAL WORKING IN CLOSE COORDINATION WITH GEOLOGISTS AND GEOPHYSICISTS FROM THE INTERNATIONAL COMMUNITY.

16. CONTINUING DETAILED WORK INCLUDES: (1) STUDY AND MAPPING OF THE FAULT TRACE ON THE GROUND AND DETERMINING ITS EXTENT BEYOND THE LIMITS WHERE IT HAS ALREADY BEEN DELINEATED; (2) COMPLETE AIRPHOTO COVERAGE OF THE FAULTS SO THAT THEIR RELATIONSHIP TO DAMAGE CAN BE ACCURATELY DETERMINED; AND (3) LOCATION OF HIGHLY SENSITIVE PORTABLE SEISMOGRAPHS IN PLACES WHERE AFTER-SHOCKS ALONG THE FAULT CAN BE PRECISELY LOCATED AND THE CONTINUING SEISMIC ACTIVITY CAN BE MONITORED TO DETERMINE THE EXTENT OF THE FAULT AT DEPTH.
MELOY

NOTE BY OC/T: PASSED ABOVE ADDRESSEES.

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